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ABSTRACT

The impact of the home learning environment on children's autonomous learning behaviors (ALBs) was examined. The three key topics addressed were: (1) the relation of types of helping techniques used by mothers to their children's help-seeking and persistence behaviors in the classroom; (2) the relation of children's ALBs to gender; and (3) mothers' general beliefs regarding the importance of encouraging children's independence in solving schoolwork problems. Specific ALBs studied were telling, showing, hinting, and encouraging children to solve problems on their own. Subjects were 54 boys and 55 girls in the fourth grade, their teachers, and their mothers. The effect of gender was considered to be of particular interest. Findings indicated that the type of help a mother reports providing for her child does not appear to be important to children's ALBs, especially girls'. Telling a boy what a word means appears to relate negatively to boys' reading persistence, although the direction of the effect is not clear. Mothers' general beliefs about the importance of having children solve schoolwork problems on their own seems to relate positively to girls' ALBs. Mothers' belief in the importance of independent problem solving was associated with increases in the frequency of help-seeking behaviors among boys. (RH)

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# Parental Helping Strategies and Children's Autonomous Learning Behaviors in the Classroom

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Parental influences and correlates of children's behavior have been of longstanding interest to researchers. A number of studies examining parental socialization factors have shown associations between parents' independence training and student achievement outcomes (e.g. Chance, 1961), or achievement motivation (e.g. Winterbottom, 1958; Hermans, Ter Laak, & Maes, 1972). More recently studies have begun to link parents' teaching strategies with other cognitive outcomes such as cognitive behavior (e.g. Sigel, 1982) and intellectual competence (e.g. Laosa, 1982, Hess and McDevitt, 1984). In addition, it is widely assumed that autonomous learning behaviors, such as appropriate help-seeking and persistence are learned or reinforced through the social interaction of parents and children (e.g. Brown, Bransford, Ferrara & Campione, 1983; Rogoff, 1986: Vygotsky, 1978). But, in fact, little research has directly addressed this assumption.

We were interested in examining more closely the relationship between the type or level of help mothers give and children's problem-solving behaviors in the classroom. Specifically, we were interested in a child's persistence in the face of difficulty, and the tendency to try independently to solve difficult problems, prior to asking for help. These behaviors are referred to as autonomous learning behaviors. Fennema and Peterson (1985) have suggested that children who engage in autonomous learning behaviors (ALB's) will be better prepared to accomplish and succeed in situations that involve problem-solving on tasks for which the solutions are not readily apparent, and the strategies for solving the problems must be constructed - the type of tasks children begin to face more frequently in later school years.

The purpose of this study was to examine the impact of the learning environment provided by parents at home on children's autonomous learning behaviors. We chose to address 3 key issues: First, how are the types of helping techniques that mothers use in particular situations related to their children's help-seeking and persistence behaviors in the classroom? Second, how is a mother's general belief regarding the importance of encouraging children's independence in solving schoolwork problems related to children's autonomous learning behaviors? And finally, what role does gender play in examining children's autonomous learning behaviors? The effect of gender is of particular interest because differential development and use of these types of autonomous learning behaviors have been proposed as possible explanations for gender-related differences in mathematics performance (Fennema and Peterson, 1985).

METHOD

Data for this study was collected in the spring of 1988 as part of a larger study of 540 children, their parents and teachers. The data presented here are taken from 54 boys, and 55 girls in the fourth grade, along with their teachers and their mothers. These children attended public school in two middle income districts in primarily white suburbs of a large metropolitan city. For the purpose of initial exploration in this area, this study is limited to fourth graders, since we know that students are doing homework and interacting with their parents around homework at the fourth grade (Chen and Stevenson, 1989).

Teachers completed individual assessment questionnaires on each participating child. They were asked to rate their students using seven-point Likert-type scales on a variety of items. Teachers were asked to rate the extent to which the child gives up when faced with a difficult problem, both in math and in reading. A high rating on this measure indicated a high rate of persistence. Teachers also rated each child's natural talent for the two subjects. Finally, teachers rated how much of the time the child asks for help from the teacher before trying to solve problems by him/herself. A high rating for help-seeking was considered "negative" as it meant that the child was requesting **excessive help** (see Nelson-Le Gall, and Glor-Scheib, 1986) more of the time (i.e. taking little time or no time to assess how to solve the problem on his/her own). Help-seeking was assessed as a personality variable, rather than within an academic domain

As a first step, this study examines only mothers, although fathers are likely to be important in the socialization of their children's autonomous learning behaviors. Mothers were asked in questionnaire format to rate their child on his/her natural talent in math and reading. In addition, mothers were asked how often (from none of the time to all of the time) they used each of four different helping strategies as a first step when their child came to them for help both in math and in reading. Figure 1 shows the question given for reading; there was a parallel set of strategies given for helping with math as well. The questions were designed to differentiate among levels of independence a parent gives the child in solving a difficult problem. These strategies included TELLING, SHOWING, HINTING, and ENCOURAGING ON OWN. In addition, mothers indicated how true (from not at all true to very true) they found a general statement regarding the importance of having children find their own answers to schoolwork problems (see figure 1).

RESULTS AND DISCUSSION

**Gender differences in autonomous learning behaviors**

Separate domain 3(talent) by 2(gender) ANOVAs revealed that at this age girls at all ability levels are seen by their teachers as more persistent in both math ($F$=3.87, $p$=.05, means are 5.13 for girls and 4.62 for boys) and reading ($F$=6.24, $p$=.01, means are 5.35 for girls and 4.33 for boys). There were no significant gender differences for excessive help-seeking, nor were there any significant gender by ability interaction effects. As seen in Figure 2, there was no evidence to support a gender difference in autonomous learning behaviors in favor of boys from teacher observation of classroom behavior.

Oneway ANOVAs revealed no significant gender differences for any of the other variables used in the study. A comparison of correlation matrices between all the variables used in the study, however, suggested that different processes were in effect for boys and girls. Therefore, in an effort to capture differential processes that may be operating to influence children's classroom use of autonomous learning behaviors subsequent analyses were done separately for boys and for girls.

**Predicting Children's Autonomous Learning Behaviors**

Mothers' reported use of particular domain strategies

The relative influence of the teaching strategies mothers report using was examined using path analysis. Reading and math were examined separately. Columnwise multiple regression was used to construct the path models. Mothers' view of child's talent was regressed on teachers' rating of child's talent. Next, mothers' reported strategy use was regressed on the two previous variables. All four of the strategies were included in this stage of the path model. This was done because an examination of the survey data suggested mothers had used the scale to indicate how much they endorsed or believed in the effectiveness of each of the strategies, rather than as an expression of the degree of comparative use. By keeping all of the strategies in the model, the relative effect of the endorsement of one strategy above and beyond use of the others could be considered. Finally, the teacher's ratings of children's excessive help-seeking and persistence were regressed on all of the predictor variables. (See model in Figure 3.) The results are depicted by gender and domain in Figures 4-7. For clarity, only those paths that were significant at $p$=.10 or better are included in the figures.

Overall, we found that mothers' reported use of the strategies did not directly influence children's classroom ALB's. In the math domain, there were no significant effects of mothers use of the strategies on either boys'

or girls' ALB's. And in the reading domain, no strategies affected girls' ALB's. For boys, however, one of the teaching strategies did show a significant effect on reading persistence. It appears that mothers who more often tell their sons what the word is or what it means have boys who are seen as less persistent in reading by their teachers ($\beta$=-.26, $p$<.05). For a boy whose mother tends to tell him the answer, one possible reason not to persist might be that he expects to be given the answer.

It was expected that children would also be more likely to ask for help before trying if their mothers usually tell them the answer directly, since the child would be provided each time with reinforcement simply for having asked for help. But in fact, mothers who "tell" more have boys who tend to be less likely to seek help before trying (although the path coefficient only approaches significance, $\beta$=-.22, $p$=.08).

These findings raise some questions. For example, why would boys be influenced by their mothers' telling, while girls are not? Or might it be that mothers use "telling" with boys, but not girls, who are less persistent to begin with?

Additionally, however, there is the consideration that the autonomous learning behaviors were based on ratings by the child's teacher. It is possible that when teachers made their ratings of boys' versus girls' help-seeking and persistence behaviors they were rating them using different criteria. This bias by gender would be consistent with previous findings that teachers' judgments of talent and effort are biased by gender (Jussim, 1987). Jussim (1987) found that teachers assumed that boys had more math talent, and that girls try harder. If the teacher sees a girl asking for excessive help, maybe that indicates lack of effort and therefore low persistence, while for boys the same amount of asking for help does not become part of the teacher rating of persistence. Perhaps as a result of the difference in how they were rated, we found this differential relationship for boys and girls to what mothers report.

While maternal use of different levels of help did not prove significant in influencing children's autonomous learning behaviors except in one case, several other important findings concerning boys' and girls' differential development of ALB's are reported in figures 4-7 and should be considered. For example, teacher rating of talent influenced mothers' rating of child's talent in both domains, and in turn mothers' ratings of their child' talent had a different effect on boys and girls. For boys only, mother's rating of math talent mediated teacher rating of math talent. The combined effect on boys' persistence in math was in fact greater than the

single direct effect of teacher talent rating on girls' persistence in math. Mother's ratings of girls' talent is not related to girls' persistence at all in either domain. Instead, mother's ratings of their daughters' reading talent has a significant effect on excessive help-seeking, and mothers' rating of math talent is marginally significant in relation to excessive help-seeking. Mothers who see their sons as having less math talent have sons who are less persistent at math but who are not more likely to seek excessive help. In contrast, mothers who see their daughters as lower in math talent have daughters who seek help more often before trying, but are not necessarily perceived as less persistent in math.

At fourth grade, in spite of mothers' differential perceptions of girls and boys, girls are seen as more persistent than boys. However, mothers' differential perceptions may play an increasingly important role for explaining children's behavior as the children move into junior high school, moreso than is apparent in the fourth grade. In fact, Parsons et al. (1982) found that mother's ratings at the junior high school level were more influential to children's self concepts and task concepts than children's own performance histories. It is plausible that if this differential perception by mothers (linking talent to persistence for boys but not for girls) continues when the children reach junior high school, that the effect may also become stronger, having more of a positive impact on boys' math persistence in comparison to girls'. This is an area that needs further exploration.

Furthermore, the gender differences in the relationship between mother rating of ability and the child's autonomous learning behaviors suggest a question regarding what tactic boys and girls use when they have difficulty solving a problem. The results provide some evidence that lower talented girls (as perceived by their mothers) in both math and in reading are likely to ask for help without even trying to solve difficult problems on their own. The same effect was not evident for boys. Yet, while higher ability girls are less likely to seek excessive help, they are not seen as more likely to be persistent as higher ability boys are seen to be. Both findings lead to questions about the adaptive or nonadaptive motivational behaviors boys and girls are learning toward solving difficult problems. If lower ability boys are not influenced to seek help, even if excessive, what are they doing instead to get solutions? And if girls are influenced in terms of their excessive help-seeking, but not in terms of their persistence, what are they missing or not learning to do when confronted with a difficult problem? Boys and girls do not appear to be approaching problems in the same way.

The dissimilarities found in the path analyses for boys and girls may be explained another way. Mothers may utilize different information when making their assessments of boys compared to girls. It may be that mother's ratings of ability are influenced differently by their children's behaviors. Eccles, Goldsmith, Jacobs, and Flannagan (1982) found that mothers made different attributions for boys' and girls' success in math. Mothers rated talent for boys as an important factor in their math success, while for girls effort was the important factor. Perhaps girls who do not seek help are seen as more effortful and therefore more able. While with boys, mothers pay more attention to how persistent they are as an indication of ability.

Mother's general beliefs about problem solving and achievement

In general, we found that mothers' report of the strategies they use in a particular problem solving situation was not directly related to children's autonomous learning behaviors. Next we addressed the relationship between mothers' general rating of their belief in the importance of encouraging children to solve problems on their own and their children's classroom ALB's. Pearson product-moment correlations were examined, again separately for boys and girls.

Mothers' indication of how often in a given task-specific situation they "Encourage their child to solve a problem on their own" was not a significant predictor of children's ALB's. However, as seen in Figure 8, mothers' general endorsement that it is important to encourage children to find their own answers to schoolwork problems was significantly positively related to girls' reading persistence ($r_s$=.24, $p$=.04) and girls' math persistence ($r_s$=.24, $p$=.04), and was also significantly negatively correlated with girls' asking for help before trying ($r_s$=-.31, $p$=.01). The correlations for boys' reading and math persistence were in the same direction as girls, but the relationships were not significant. Interestingly, or oddly, for boys, mothers' belief that solving problems independently is important was significantly positively related to boys' seeking excessive help ($r_s$=.27, $p$=.03, boys more likely to see excessive help).

We see a picture for girls that follows intuitively. When mothers think it is important for children to solve problems on their own, girls indeed are less likely to ask for help from the teacher before trying on their own, and girls are more likely to spend time engaged in solving difficult tasks. The findings for boys reveal a pattern that looks similar to what was suggested earlier by the task specific helping results. It seems that mothers who think that finding answers to schoolwork problems

independently is important have boys who nevertheless are more likely to seek excessive help.

SUMMARY

In general we have seen that at this age, the particular type of help a mother reports she provides for her child does not appear to be directly important to children's classroom ALB's, especially not for girls. To some extent, telling a boy what a word is, or what it means does appear to relate negatively to boys' reading persistence, although the direction of the effect is not clear.

Mothers' more general beliefs about the importance of having children solve schoolwork problems on their own does seem to be related to girls' autonomous learning behaviors, and in a positive way. Surprisingly, however, a belief that it is important to solve schoolwork problems independently is associated with boys seeking help more frequently before attempting problems on their own.

One direction for future research in autonomous learning behaviors would be to elaborate on the view of help-seeking. This might include examining children's ideas about what occurs in the helping situation between parents and children and also between teachers and children. The affective interaction may be an important mediator to children's approach to solving difficult problems. One that might help us to better understand the gender differences we found. In addition, while this study examined excessive help-seeking exclusively, there also seems to be the need to look at those children who don't ask for help even when it would be appropriate. Again, perhaps this would give us some insight into the gender differences that occur. We are now gathering data to address both these issues.

Finally, it seems important when future research in this area is conducted to take into account not only the observable differences between boys and girls, but also the differential processes that may be working to influence children's autonomous learning at different stages of their development. Further exploration of these differential processes may be one key to understanding the development of children's autonomous learning behaviors.

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FIGURE 1

**SPECIFIC SITUATION**

Sometimes children have difficulty with reading or understanding a particular word in a story or reading assignment. Please indicate how often you use each of these strategies as a first step when your child comes to you for help with reading.

__I pronounce the word for them or **tell** them its meaning.
__I get the dictionary and we look up the word together. (**show**)
__I give **hints** as to how to sound out the word or how to figure out what it means.
__I tell them to sound out the word or to look up the word in a dictionary. (**encourage on their own**)

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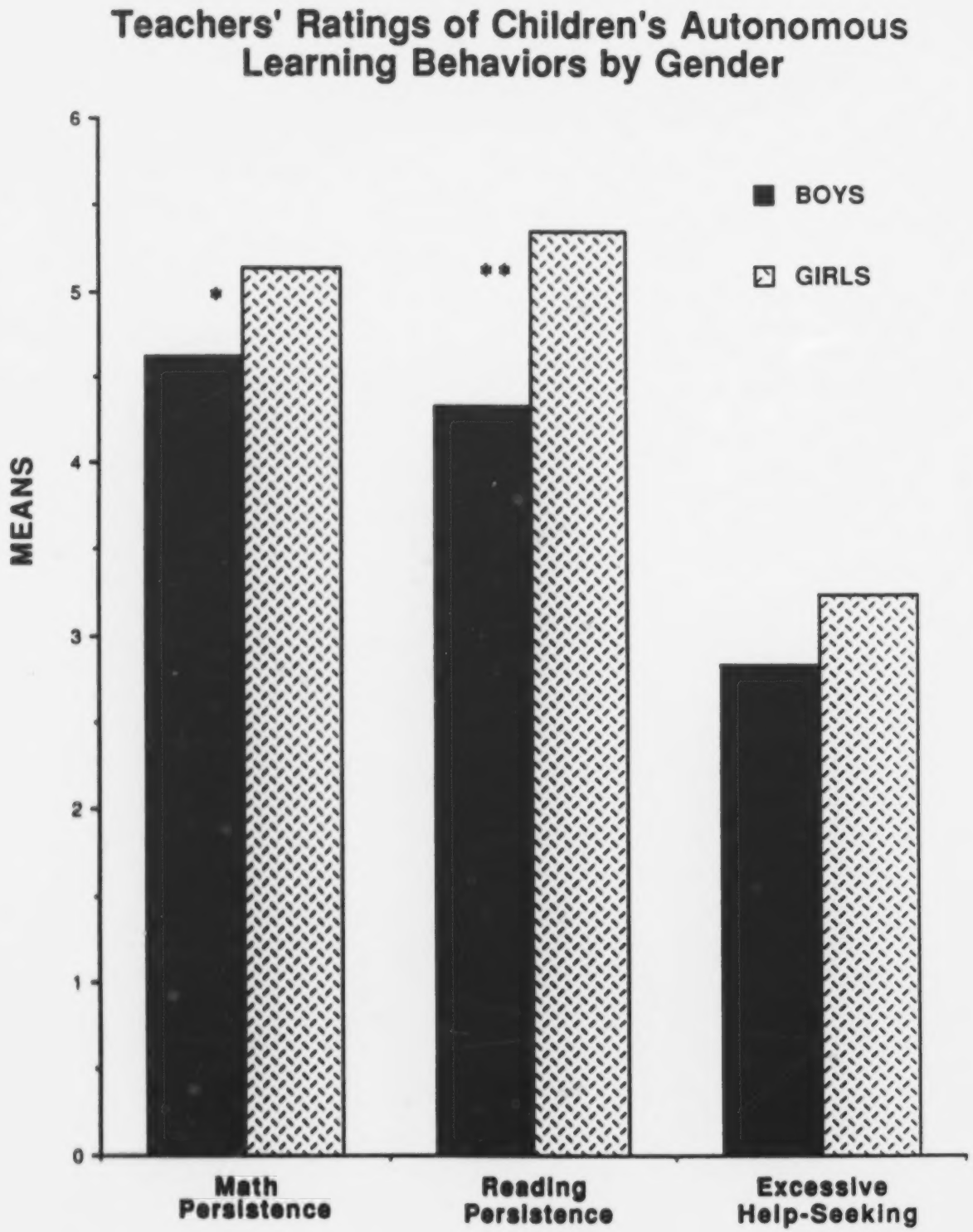
GENERAL BELIEF

**I think it is important to encourage children to find their own answers when they have problems with schoolwork.**

FIGURE 2




*p<.05 **p<.01

Figure 3

PATH MODEL

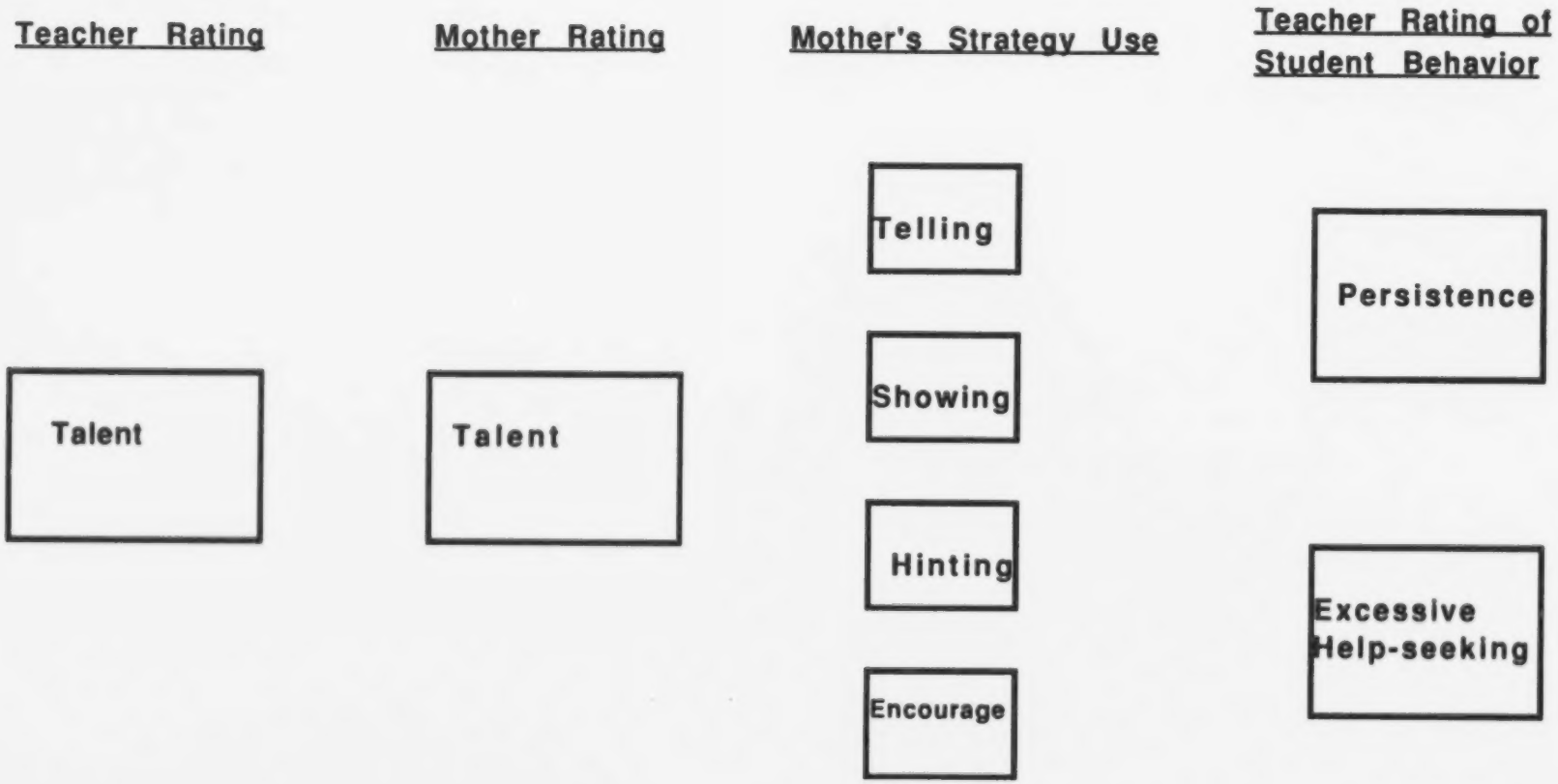
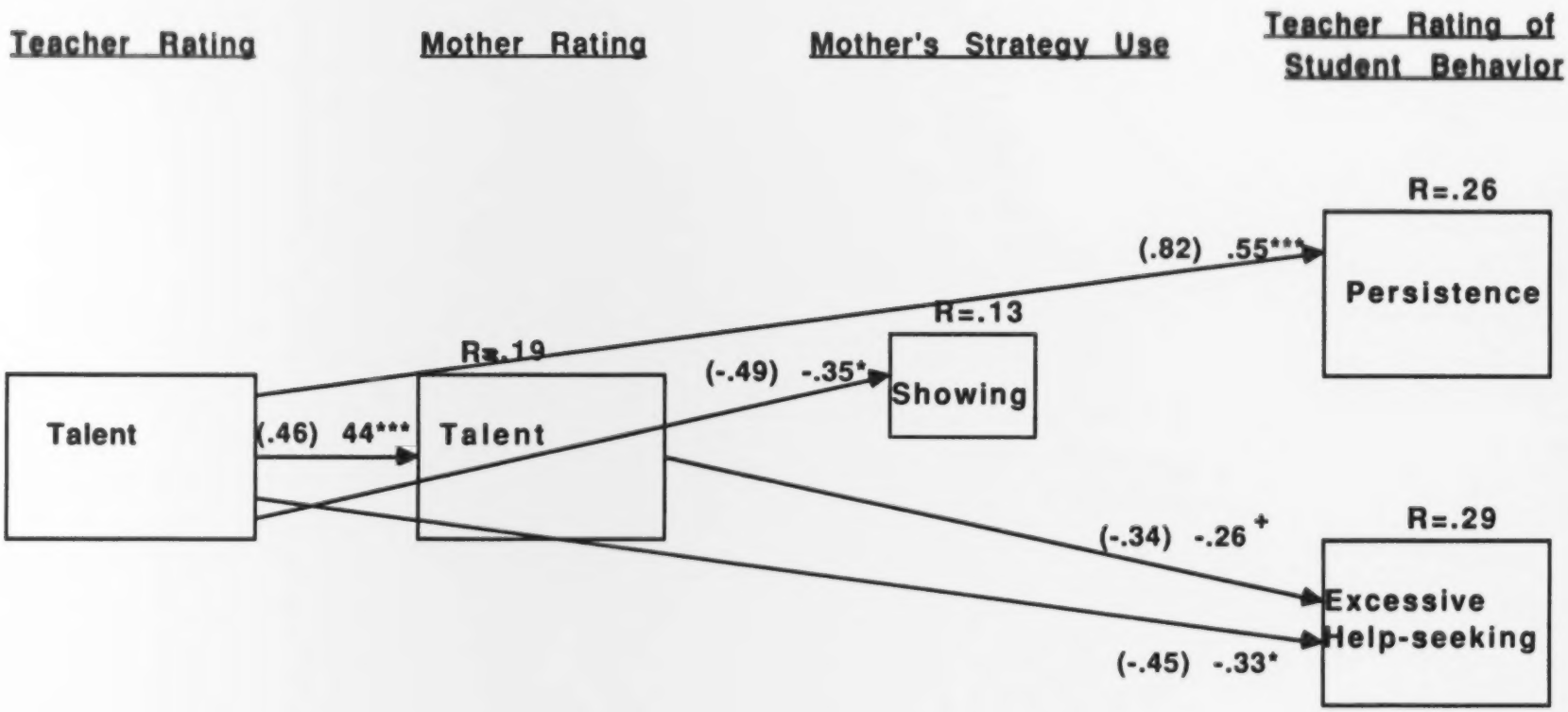


Figure 4

## Path Analysis--FEMALES/MATH

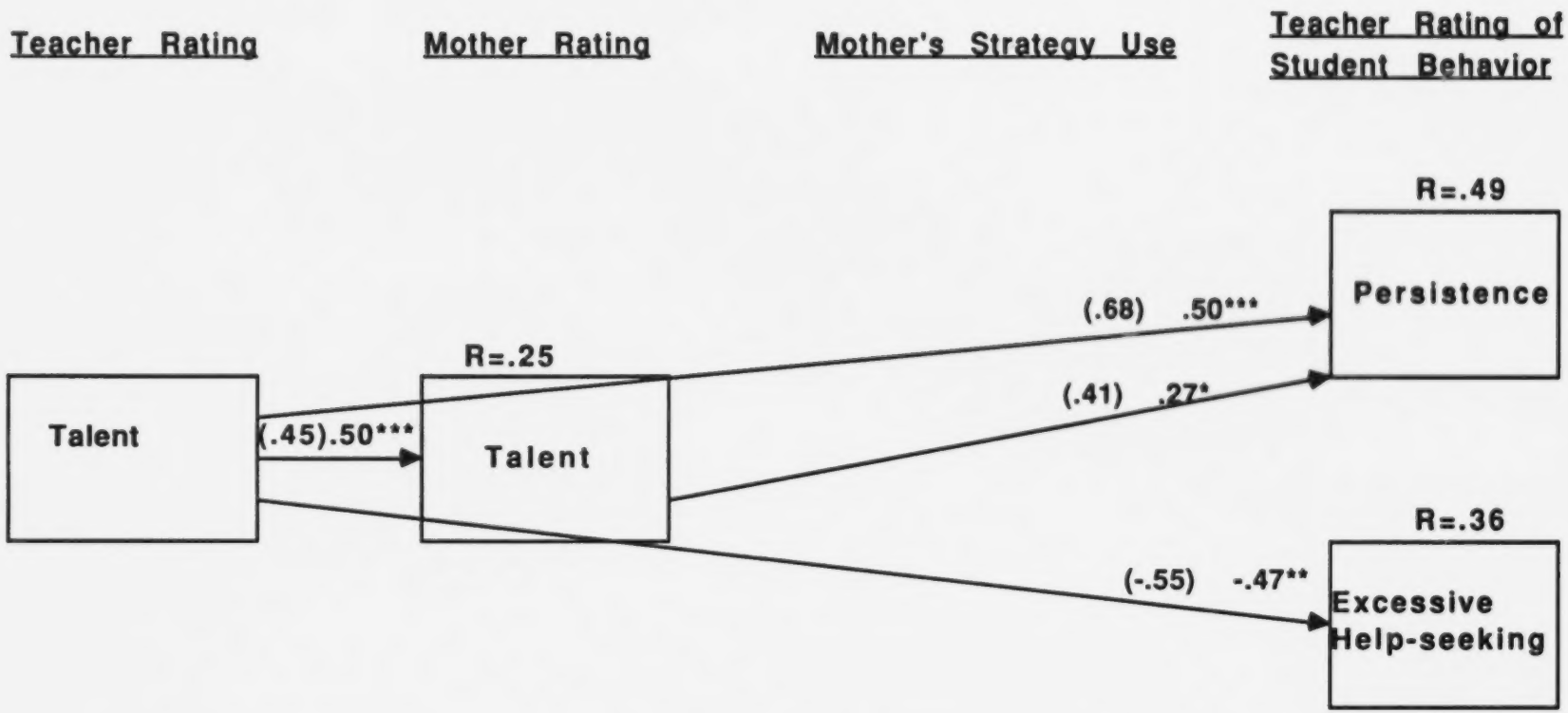



Note- Standardized coefficients are presented, preceded by unstandardized coefficients in parentheses.

+p<.10 *p<.05 **p<.01 ***p<.001

Figure 5

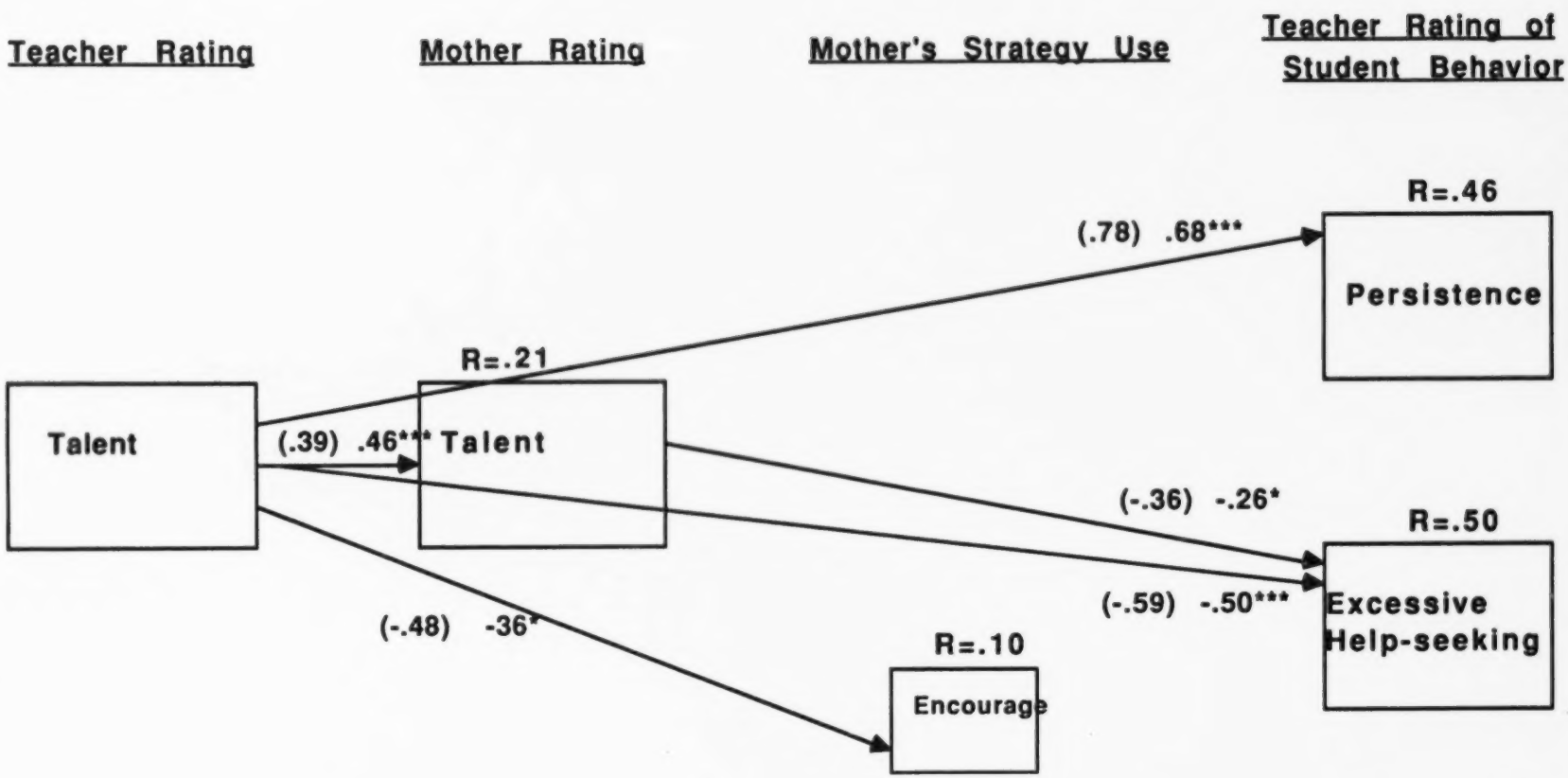
## Path Analysis--MALES/MATH




Note- Standardized coefficients are presented, preceded by unstandardized coefficients in parentheses.
*p<.05 **p<.01 ***p<.001

Figure 6

## Path Analysis--FEMALES/READING

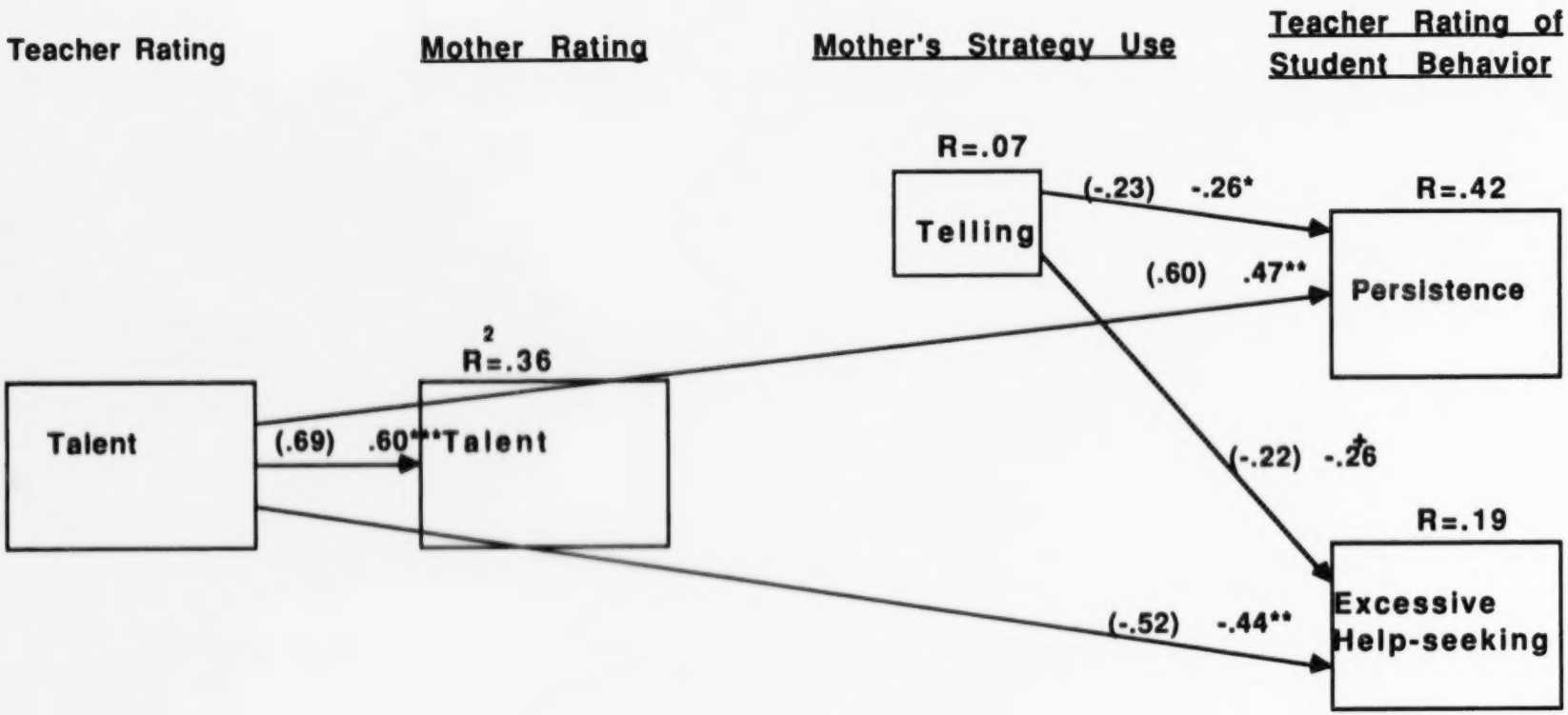



Note- Standardized coefficients are presented, preceded by unstandardized coefficients in parentheses.

*p<.05 **p<.01 ***p<.001

Figure 7

Path Analysis--MALES/READING

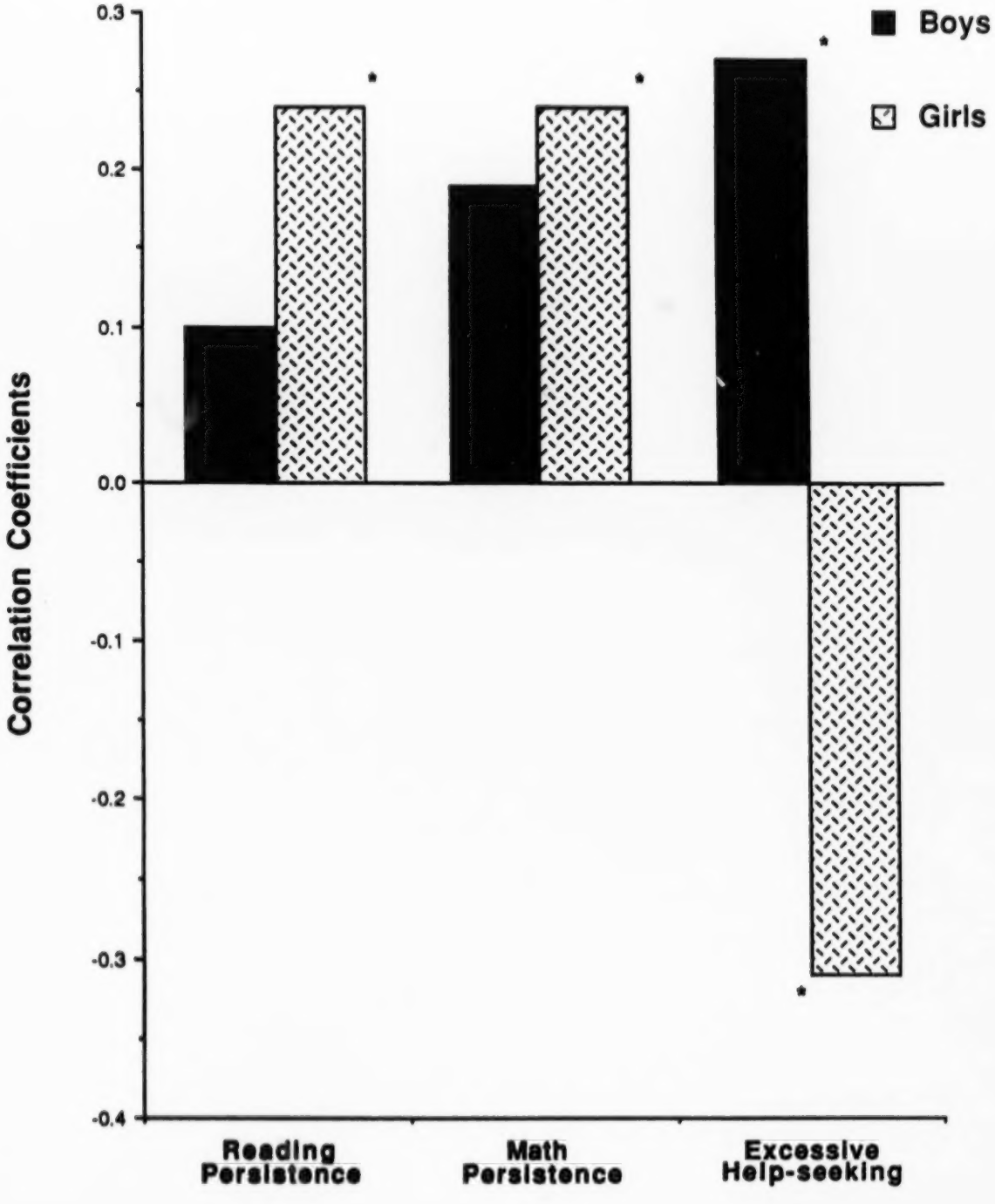



Note- Standardized coefficients are presented, preceded by unstandardized coefficients in parentheses.

+p<.10 *p<.05 **p<.01 ***p<.01

FIGURE 8

## Relation Between Mothers' Belief in Importance of Solving Problems on Own and Children's ALB's by Gender




* p<.05 **p<.01